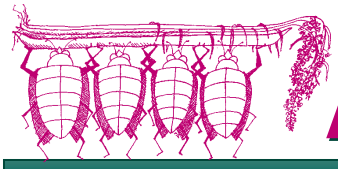
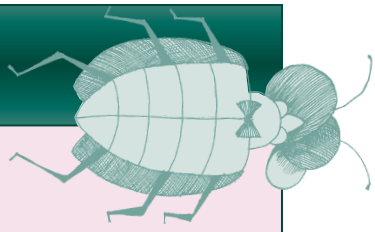


ACTIVITY 14 GRADES 6-12

WISCONSIN WET 'N' WILD



Objective

➡ **Students will make value judgments about factors that affect the ecology of a wetland habitat.**

Time Requirement

50 minutes.

Wisconsin Model Environmental Education and Science Standards

Environmental Education: **B.8.3, B.8.5, B.8.6, B.8.8, B.8.10, B.8.15, C.8.3, D.8.7, B.12.2, B.12.3, B.12.4, B.12.6, B.12.7, B.12.11, C.12.1, D.12.4.** ***Science*****: B.8.6, C.8.11, F.8.9, F.8.10, A.12.1, A.12.2, A.12.4, F.12.7, F.12.8, G.12.5, H.12.6, H.12.7.**

DESCRIPTION

This game acquaints students with the biological complexities of a wetland habitat and reviews factors destructive to or sustaining of Midwestern wetlands and their associated landscapes. Students should enjoy the game, but they should also perceive the biological and social relevance of the information presented.

PROBLEM

What are some of the diverse factors that affect the ecology of a wetland habitat?

MATERIALS

Per student group:

- ❑ A copy of "Rules of the Game" handout (page 52).
- ❑ A game board.
- ❑ A set of fact cards (pages 53-68).
- ❑ A die and a game token for each player.

PREPARATION

Construct the game boards. The template for a game board is a typical game board that has a *start* space and a series of 20-30 spaces that lead to the *finish* space. You could create game boards that fit onto a table or use a series of squares on the ground and have the students walk across the board instead of moving tokens. Some of the squares must be shaded.

Mount copies of Wetland Facts on poster board or cardboard and cut out sets of game cards, keeping only one statement on a card.

U.S. FISH AND WILDLIFE SERVICE

WISCONSIN WETLANDS ASSOCIATION

Unfortunately, many of Wisconsin's wetlands have been harmed by human activity over the past 100-150 years. Today regulations control the draining and filling of wetlands.

Activity 14. WISCONSIN WET 'N' WILD

PROCEDURES

1. Divide the class into groups of four students. Distribute the materials so that each group has a game board, a copy of the rules, a die, tokens (if they are used), and a set of fact cards.
2. Ask students to read the rules before beginning play, or explain the rules to the class as a whole. The latter may be the preferred strategy because you can emphasize the concepts that students should think about and discuss during the game.
3. Monitor the play as lively discussions are likely to develop. If discussions take enough time that a group may not even finish the game, then establish a maximum amount of time that students may take to reach a decision. Assist any group that has difficulty understanding the information presented in the Wetland Facts cards or reaching fair and reasonable decisions. Various interpretations of the same statement are possible. For example, any statement may be judged positive by one group and neutral by another. One interpretation is not necessarily more correct than the other, but the justification for the choice should be plausible.

Each student orally responds to which fact card was most impressive or enlightening to him/her.

BACKGROUND INFORMATION

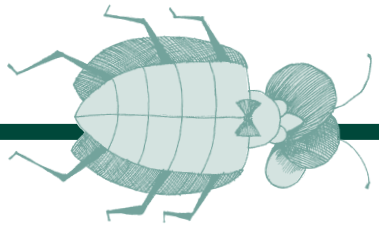
At this point in their study of wetlands, students should be aware of the need to preserve our remaining wetlands and the challenge of recovering others. As a general review and as an introduction to this activity, generate with the class a list at the chalkboard of the values of wetlands. Give hints to help students make this list as long as possible. Include everything from natural fish nurseries to flood control to bird habitat. Explain that students will now play a game that will add to their understanding of the value of wetlands.

STUDENT ASSESSMENT

Each student selects one statement from the cards and writes a paragraph justifying why that statement is beneficial or detrimental to wetlands and their associated landscapes. Check the choices before students begin writing to ensure that no one has selected a neutral statement unless he or she has an idea for a valid justification.

EXTENSION

Have students search newspapers, magazines, and other current materials for articles on wetlands and wetland habitats. Good sources are natural history magazines such as *Audubon*, *National Wildlife,* and *National Geographic*. Have students read the articles and pull out pertinent facts about wetlands, such as those included in this lesson. Have them create their own set of cards and replay the game. Another activity is to create a bulletin board display of these facts that have been lumped into the three categories used above.



Wisconsin Wet 'N' Wild

Rules of the Game

1. One student shuffles the game cards and places them face down in the center of the playing board.

2. Each player chooses a token (if they are used) and places it on *Start*.

3. Each player, in turn, rolls the die; the player with the highest number begins the game by rolling the die again and moving forward the indicated number of spaces.

4. If the player lands on an unshaded square, the turn passes to the next player. If the player lands on a shaded square, the player draws a game card from the top of the pack and reads aloud the statement on it. The other three players then decide if the statement is positive (beneficial), negative (destructive), or simply neutral with regard to wetlands and their associated landscapes. The player who landed on the square may express an opinion, but the ultimate judges are the other players.
   - If the statement is considered negative, the player moves back one square.
   - If the statement is considered positive, the player moves forward one square.
   - If the statement is considered neutral, the player remains on the same space.

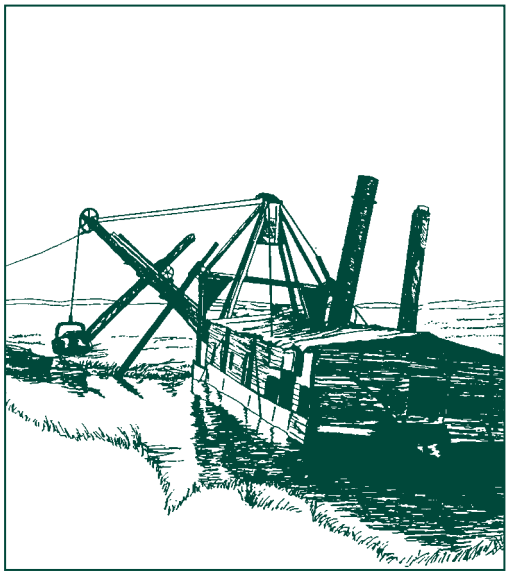
   Then the player's turn ends, and the next player takes a turn.

5. If a player's token lands on an occupied square, the player moves it back to the nearest unoccupied square.

6. Play proceeds until each player reaches *Finish*. Finishing first may in itself be enough reward, but you can also grant the winner the power to be the sole judge of the wetland _____ for the remainder of the game. The other players, of course, continue to express their points of view.

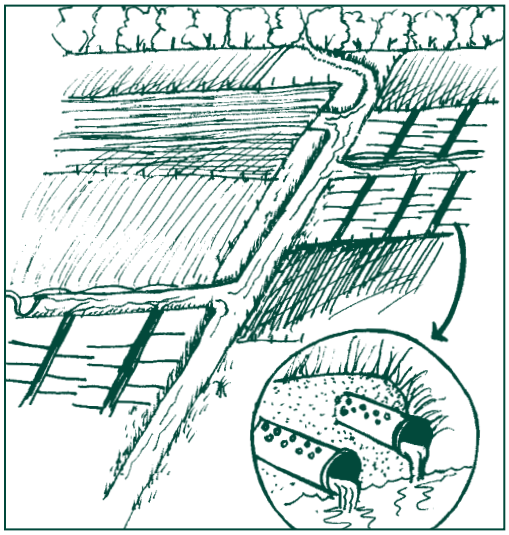
Wisconsin Wet 'N' Wild Game Card

Sixty acres of wetlands are destroyed each hour in the United States.



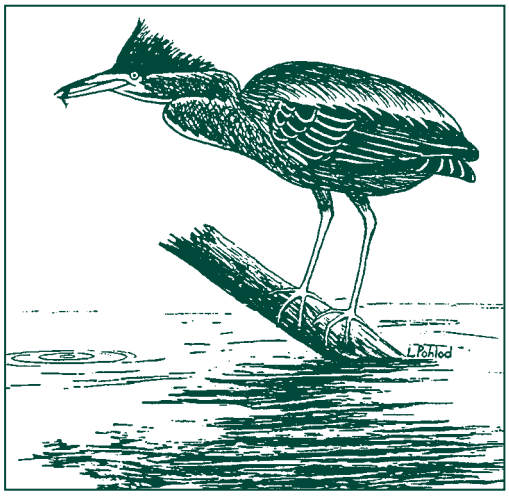
Wisconsin Wet 'N' Wild Game Card

The water table in a marsh is permanently lowered due to the drainage of adjacent farmland.



Wisconsin Wet 'N' Wild Game Card

When water levels drop, fish and other animals are concentrated in small pools. Wetland birds like herons, egrets, and eagles have a feast.

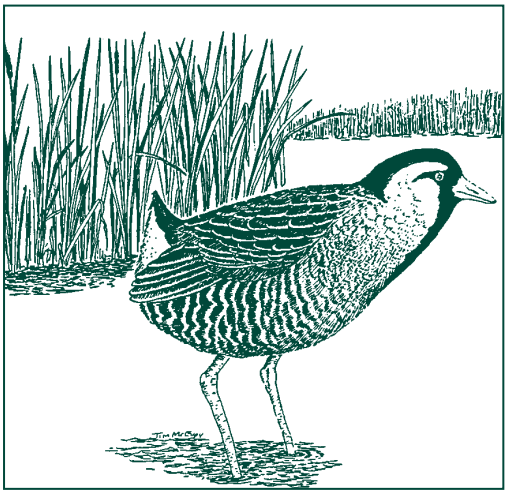


Wisconsin Wet 'N' Wild Game Card

A family of beavers dams a small stream to create a large, shallow wet area. Soon cattails, bulrushes, and arrowhead plants colonize the site.

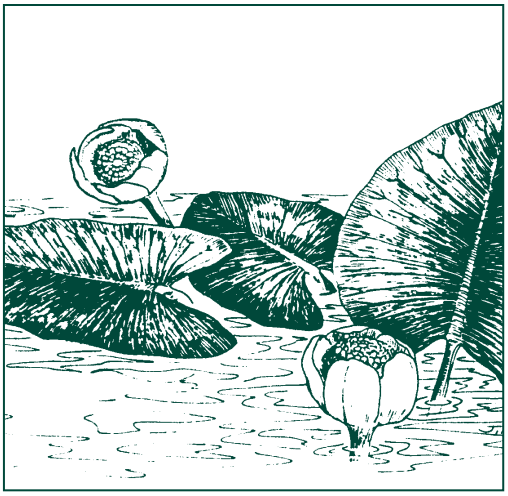
Wisconsin Wet 'N' Wild Game Card

During dry weather, mudflats are exposed and moist plants grow and produce seeds that are eaten by waterfowl and other birds.



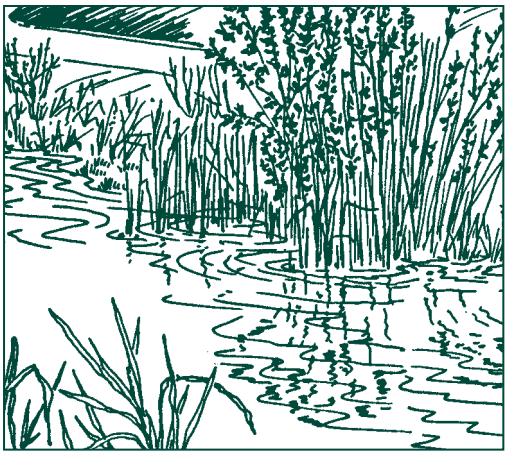
Wisconsin Wet 'N' Wild Game Card

The leaves of floating plants, like water lillies, provide a home for many small animals on their upper and lower surfaces.



Wisconsin Wet 'N' Wild Game Card

During the late summer, when the water level drops, marsh soils are exposed to oxygen, thereby speeding the process of plant decay and the recycling of nutrients.

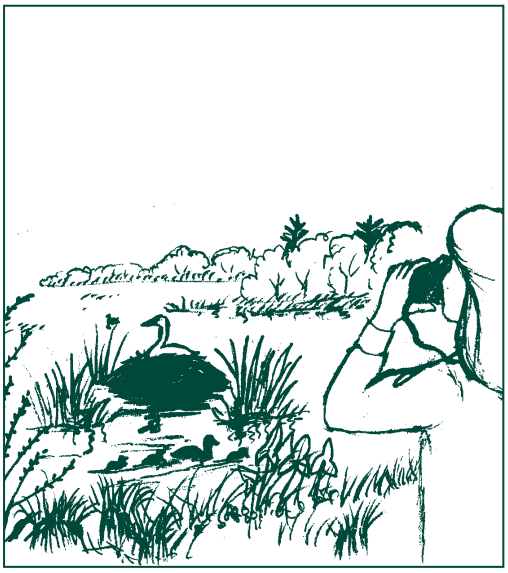


Wisconsin Wet 'N' Wild Game Card

Along the wetland margin, abundant cattails, rushes, and sedges provide an ideal home for the endangered rice rat.

Wisconsin Wet 'N' Wild Game Card

Migrating birds use wetlands on a seasonal basis to rest, feed, and raise their young.

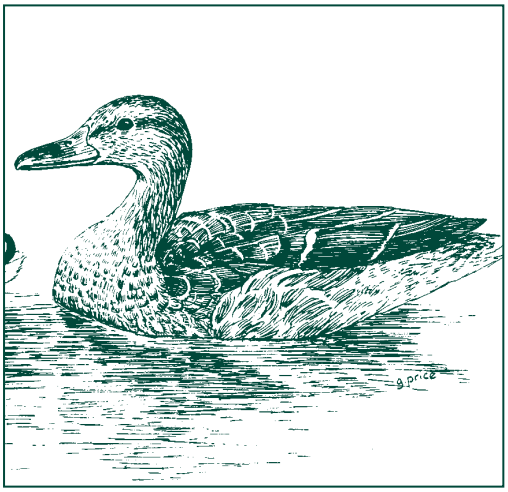


Wisconsin Wet 'N' Wild Game Card

Many kinds of invertebrates – mollusks, sponges, flatworms, crustacea, and insects – are important parts of food chains and transfer energy to other organisms.

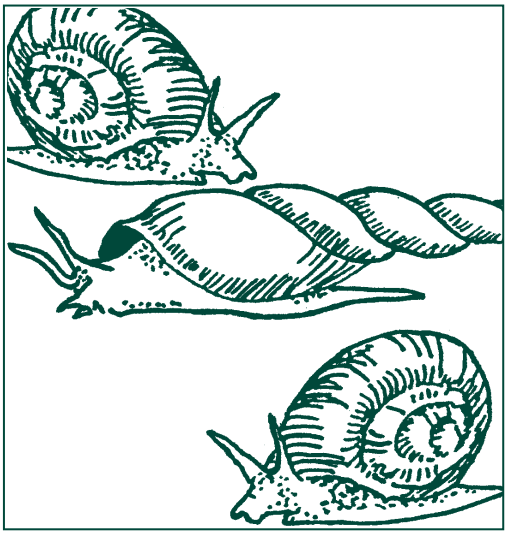
Wisconsin Wet 'N' Wild Game Card

The different water depths in a marsh allow both dabbling (mallard) and diving (canvasback) ducks to forage for food.



Wisconsin Wet 'N' Wild Game Card

The presence of mussels and snails indicates that water is relatively clean and free of pollution.



Wisconsin Wet 'N' Wild Game Card

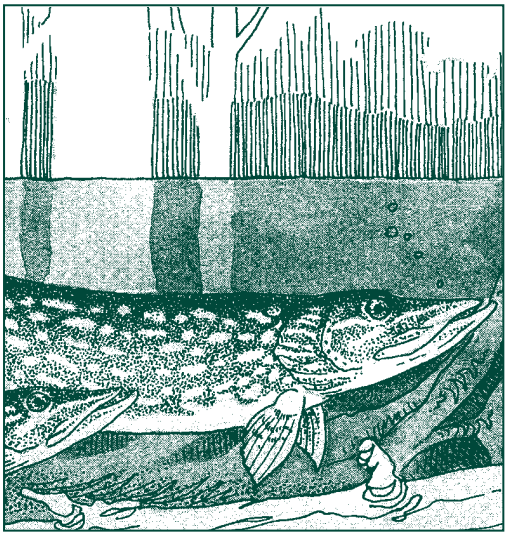
Frogs, toads, and salamanders find wetlands ideal feeding and breeding grounds each spring and early summer.

Wisconsin Wet 'N' Wild Game Card

More kinds of plants live in the moist soil around wetland edges than live in the open water.

Wisconsin Wet 'N' Wild Game Card

Fishes that inhabit marshes must be able to tolerate water and relatively warm temperatures.



Wisconsin Wet 'N' Wild Game Card

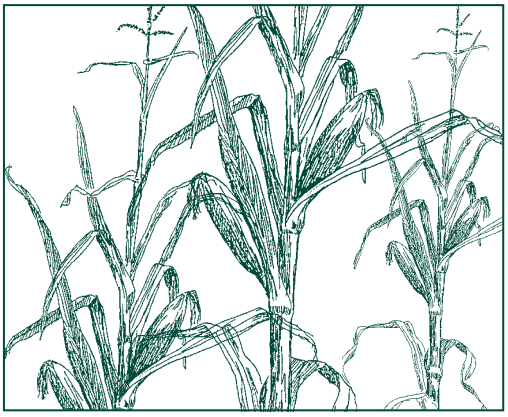
A large quantity of living things (biomass) is produced in a wetland; thus wetlands are said to be highly productive.

Wisconsin Wet 'N' Wild Game Card

The soils and water in a bog are very acidic and allow only a few species of plants to grow.

Wisconsin Wet 'N' Wild Game Card

A wetland next to a large river is leveled, drained, and planted with corn. During the rainy season, water that originally remained trapped in the wetland now flows downstream and causes flooding.

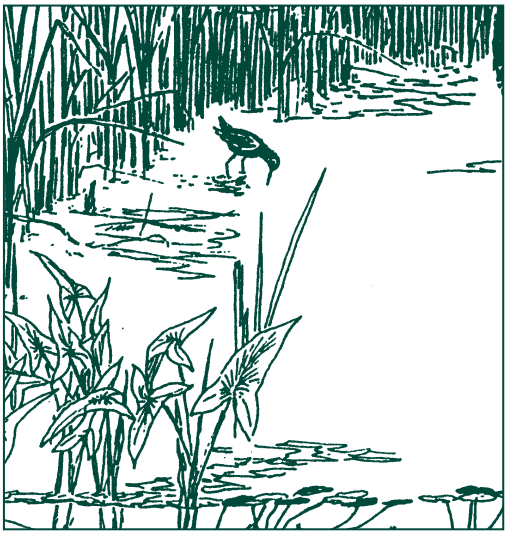


Wisconsin Wet 'N' Wild Game Card

Wetlands provide habitat for an incredible number of plants and animals.

Wisconsin Wet 'N' Wild Game Card

Peat and muck wetland soils attract polluting chemicals and allow them to be broken down by microorganisms.

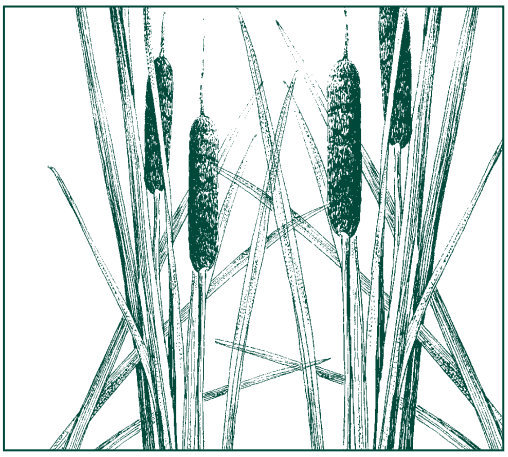


Wisconsin Wet 'N' Wild Game Card

Cattails and bulrushes take up a large percentage of polluting nitrates that are washed off from nearby farm fields and convert these chemical substances to plant tissue.

Wisconsin Wet 'N' Wild Game Card

Extra nitrogen (nitrates) from farm fields allows a single species of plant, cattails, to out compete its neighbors, thereby reducing the diversity of the marsh.



Wisconsin Wet 'N' Wild Game Card

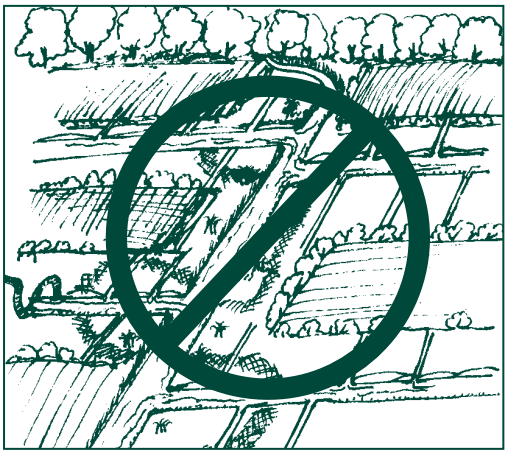
Soil eroded from nearby fields (sediment) is trapped by wetland plants and settles to the bottom before it can enter a river.

Wisconsin Wet 'N' Wild Game Card

Wetlands act as sponges and store water from wetter times. During a drought, this water is slowly released into nearby streams.

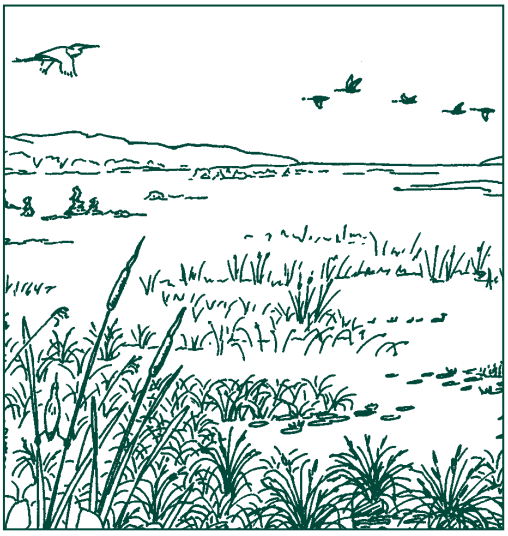
Wisconsin Wet 'N' Wild Game Card

For wetlands to serve their biological functions, they must not be levied, drained, channelized and straightened, or stripped of their native vegetation.



Wisconsin Wet 'N' Wild Game Card

Only 103.3 million acres of the original 221 million acres of wetlands in the United States remain.



Wisconsin Wet 'N' Wild Game Card

More plant material is produced in a marsh than in a cornfield. Wetland plants can produce 25,000 pounds of dry plant matter per acre; an acre of corn yields about 12,500 pounds.

Wisconsin Wet 'N' Wild Game Card

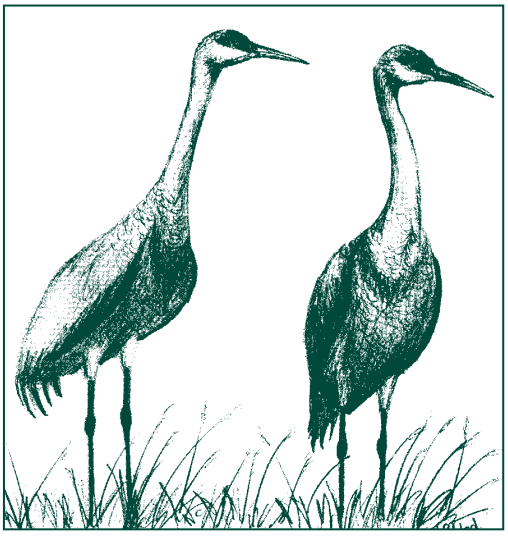
Wisconsin has over 40,000 acres with purple loosestrife, and state law bans the sale, distribution, or cultivation of the plant. There is a $100 fine per violation.

Wisconsin Wet 'N' Wild Game Card

One-third of all threatened and endangered plants and animals in the United States rely on wetlands for their homes.

Wisconsin Wet 'N' Wild Game Card

Wildlife use wetlands as corridors through which they move in search of food and shelter.



Wisconsin Wet 'N' Wild Game Card

Wetlands are beautiful.

Wisconsin Wet 'N' Wild Game Card

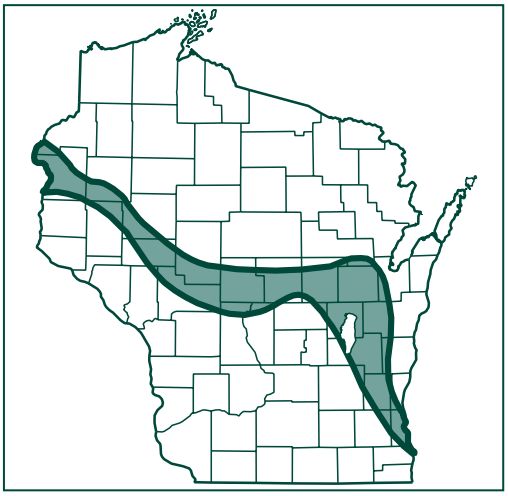
Wetlands have a profound ability to improve water quality. They help keep water supplies clean by trapping sediment and filtering out contaminants.

Wisconsin Wet 'N' Wild Game Card

Of the original 10 million acres of wetland in Wisconsin at the time of European settlement, today only about half remains.

Wisconsin Wet 'N' Wild Game Card

Wetland vegetation often differs from northeastern to southwestern Wisconsin, with a mixing of the two in the "tension zone."



Wisconsin Wet 'N' Wild Game Card

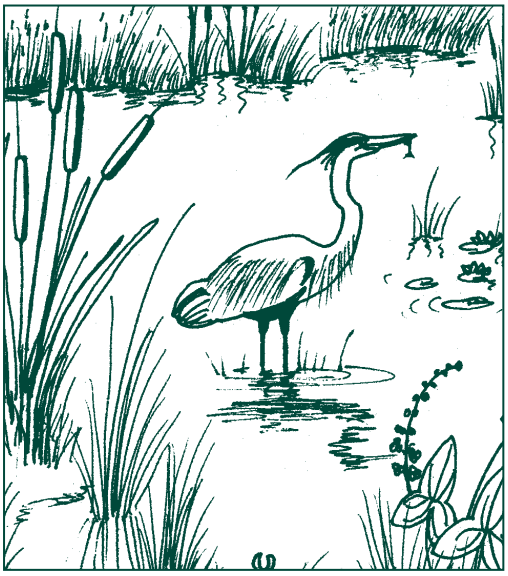
Prairie wetlands are the most productive of all temperate ecosystems. Their lush growth is used by wildlife for food, cover, and breeding.

Wisconsin Wet 'N' Wild Game Card

Wetlands reduce the turbidity of water. As sediment-laden water enters a wetland, is loses velocity, and the suspended solids settle to the bottom.

Wisconsin Wet 'N' Wild Game Card

Ten states in the United States have lost more than 70 percent of their wetlands.



Wisconsin Wet 'N' Wild Game Card

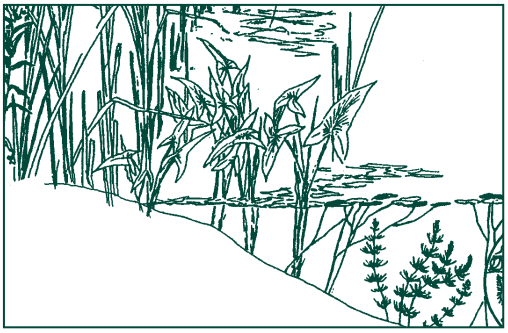
Wetland vegetation has a filtering effect. Solids are knocked out of the water as they attach to the stems and roots of aquatic plants.

Wisconsin Wet 'N' Wild Game Card

Wetlands reduce flood peaks by storing water.

Wisconsin Wet 'N' Wild Game Card

Wetland plants improve water chemistry. Nitrogen, phosphorus, and carbon provide the basic elements for the growth of plant cells. As these three elements are removed from water and put into plant production, the water becomes clearer.

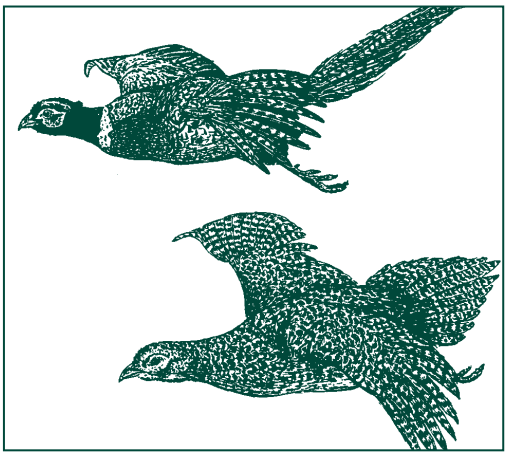


Wisconsin Wet 'N' Wild Game Card

More than 117 million acres of wetlands have been lost in the lower 48 states since colonial times – over half the estimated original total wetland acreage.

Wisconsin Wet 'N' Wild Game Card

In harsh winters with heavy snow, the dense tangle of marsh vegetation provides cover for pheasants – sometime the only cover they can find.

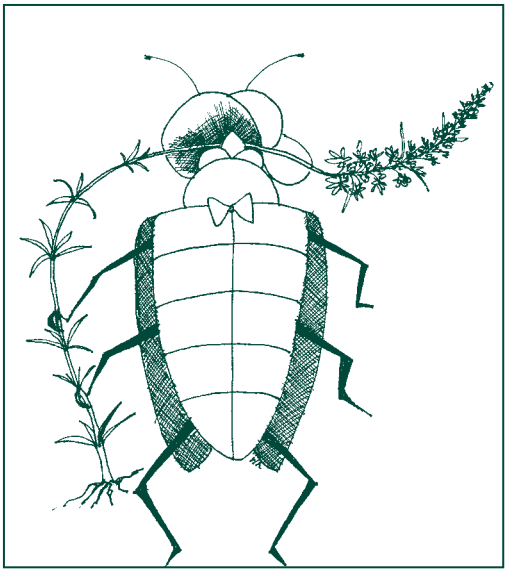


Wisconsin Wet 'N' Wild Game Card

In Wisconsin and elsewhere, nitrates are a serious source of ground water contamination and a threat to the quality of drinking water. Because nitrates are very soluble, they leach quickly through the soil into shallow aquifers. If nitrates enter a wetland, however, they experience a chemical transformation. The microbes present in wetland sediments convert the potentially harmful nitrates into nitrogen gas, which is harmless.

Wisconsin Wet 'N' Wild Game Card

Eurasian beetles are released in Wisconsin wetlands to help control purple loosestrife.



Wisconsin Wet 'N' Wild Game Card

A study conducted in Eagle Lake Marsh, Iowa found that 86 percent of the nitrate level of the lake had been removed by the time the water made its way to the outlet of the marsh.

Wisconsin Wet 'N' Wild Game Card

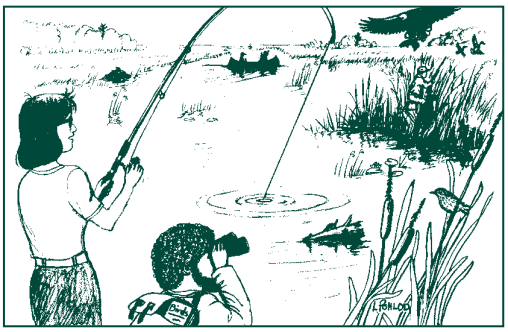
Some people maintain that the highest value to be placed on wetlands is their potential development as real estate and crop-producing acreage.

Wisconsin Wet 'N' Wild Game Card

Drained and tiled wetlands made some of the richest farmland in the Midwest.

Wisconsin Wet 'N' Wild Game Card

Some people maintain that the highest value to be placed on wetlands is their ability to improve the quality of water and to provide habitat for a remarkable diversity of plants and wildlife. Others think that their recreational value is most important.

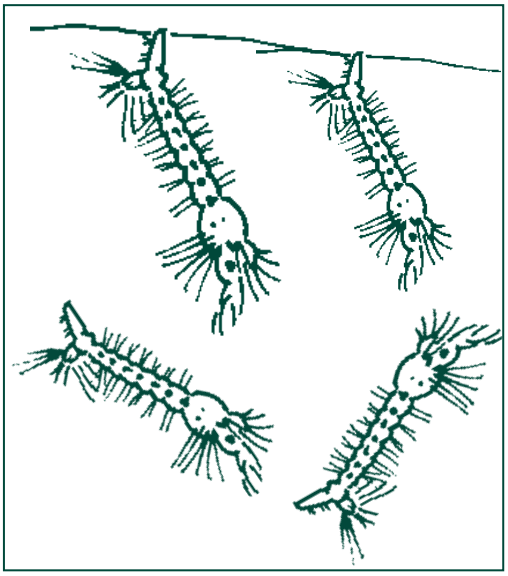


Wisconsin Wet 'N' Wild Game Card

Purple loosestrife colonizes a wetland.

Wisconsin Wet 'N' Wild Game Card

Mosquito larvae are an important food source for young fish.



Wisconsin Wet 'N' Wild Game Card

Purple loosestrife is beautiful.

Wisconsin Wet 'N' Wild Game Card

A wetland becomes dry during a drought and a land developer builds an apartment building on it.

Wisconsin Wet 'N' Wild Game Card

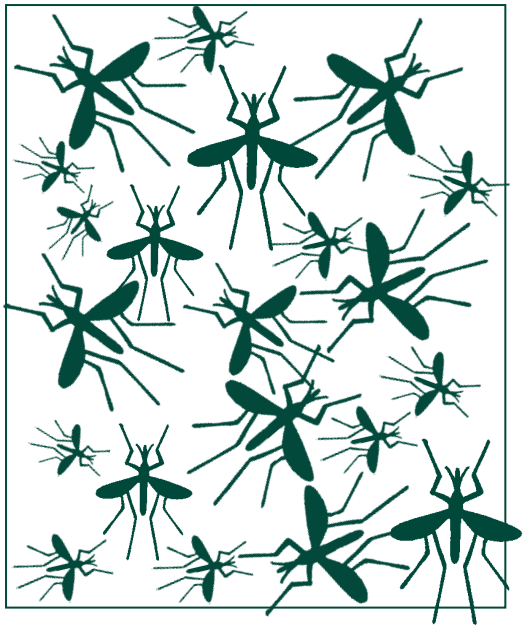
Wetlands attract duck hunters.

Wisconsin Wet 'N' Wild Game Card

Previous generations have found wetlands useful as places to dump their trash.

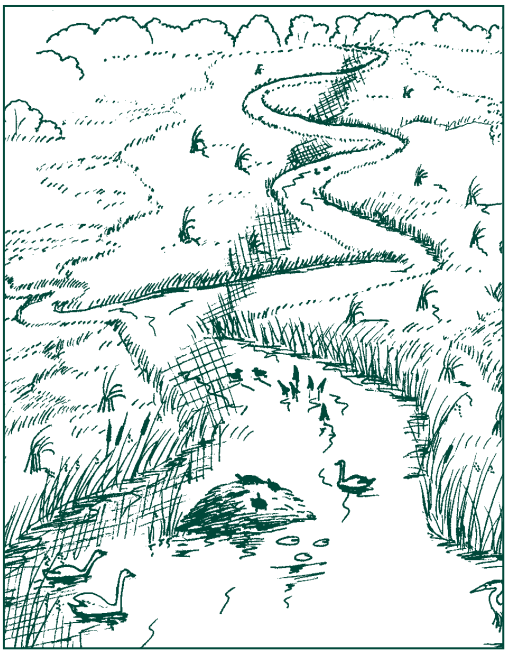
Wisconsin Wet 'N' Wild Game Card

Mosquitoes reproduce in large numbers in wetlands.



Wisconsin Wet 'N' Wild Game Card

Wetlands can be restored.



Wisconsin Wet 'N' Wild Game Card

Reintroduction of a native plant such as wild rice is an important component of wetland restoration in Wisconsin.

Wisconsin Wet 'N' Wild Game Card

STUDENT CARD

Wisconsin Wet 'N' Wild Game Card

STUDENT CARD

Wisconsin Wet 'N' Wild Game Card

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